

REMARKS

Claims 1, 3-6, and 8-9 were pending in the patent application. By this amendment, Applicants introduce Claim 10 which is fully supported by the Specification as originally filed (see: page 3, lines 7-12; page 14, lines 16-24; and page 23, Claim 5).

The Examiner has newly rejected Claims 1, 3-6 and 8-9 under 35 USC 103(a) as unpatentable over Ho. For the reasons set forth below, Applicants believe that Claims 1, 3-6, and 8-10 are allowable over the cited art.

The present invention provides a novel apparatus and method for managing mobile agents wherein agent servers maintain not only the history of movements of mobile agents at their locations but also keep a count of the accumulated total of movements by each of the mobile servers for which the agent servers have a history. In addition, the agent servers generate requests for updating registration server locations and periodically communicate the requests to the registration server, wherein the requests include the history of movements with the accumulated counts. At the registration server,

tables are updated for any given mobile agent using only the information that is accompanied by the highest count of accumulated movements, thereby avoiding updating with stale information. Independent Claims 1 and 6 recite the apparatus and method.

As set forth in independent Claim 1, the invention is a mobile agent management apparatus comprising a plurality of agent servers (page 2, line 19, 1242 and 1244 of Fig. 12); and a registration server (page 2, lines 19-20 and 1245 of Fig. 12) for maintaining location information of mobile agents, wherein each of the plurality of agent servers comprises means (1246 of Fig. 12) for maintaining a history of movement of each of said mobile agents (page 2, lines 21-22) including a counter for accumulating a count of the accumulated number of movements for each of said mobile agents (page 3, lines 6-7); and request means (1247 of Fig. 12) for periodically generating requests for updating location information of each of said agents (page 3, lines 5-6), said requests including at least a mobile agent identifier and said accumulated number of movements for

said mobile agent, to renew location information at said registration server (page 3, lines 9-10).

As set forth in independent method Claim 6, the method comprises steps of, on each of the agent servers, maintaining history of movement of each of the mobile agents (page 12, lines 9-10) including accumulating a count of the number of movements for each of the mobile agents (page 14, line 18); and periodically generating requests (Figs. 23 and 24) for updating and deleting registries, said requests including at least a mobile agent identifier and said count of the accumulated number of movements for said mobile agent (page 8, lines 13 and 18); and at said registration server (Fig. 26), renewing location information of each of said mobile agents kept by said registration server with said requests (page 8, line 24-page 9, line 1).

Claims 3 and 8 recite means and steps for comparing the count of the accumulated number of movements to a threshold number of movements (page 12, lines 9-17; page 13, lines 2-10; Request Sending Buffer of Fig. 13). Claims 4 and 9 further recite means and steps for the agent servers to generate a request for updating location

information to the registration server when the count exceeds a predetermined threshold (page 13, lines 2-10, Fig. 13). Claims 5 and 10 further recite the registration server's means and steps for comparing the accumulated number of movements in an update request to a stored accumulated number of movements for the mobile agent and updating the location information only when the accumulated number of movements in the update request exceeds the stored accumulated number of movements (page 3, lines 7-12 and page 14, lines 16-24).

Applicants respectfully assert that the cited art does not teach or suggest the invention as claimed. The Examiner has newly cited the Ho patent against the claims. The Ho patent teaches a method and apparatus for tracking mobile stations in a wireless communications system. Under the Ho patent teachings, movements of a mobile station are tracked to determine where the mobile station is in relation to places it can call (its paging area). Ho teaches that the mobile station (e.g., a cell phone, Col. 4, lines 10-14) includes a movement history register 302 which it increases by "1" when it enters into a new cell coverage area (see: Fig. 6, steps 600-

602). However, the movement counter in the Ho mobile devices does not record an absolute count of accumulated movements. Ho expressly teaches that, since a mobile station may perform so-called "loops", the newly "counted" movement may be removed from the counter/register if the cell region ID already appears in the register, thereby indicating that the device has looped back (see: Col. 5, lines 21-41). "In response to identifying the presence of a loop, the loop is removed from the path" (see: Col. 2, line 66-Col. 3, line 1). Ho further teaches that "cell IDs are removed from the top of the movement history registers 404 until... the loop is removed" (Col. 5, lines 38-41) and "[m]ovement history register 404 and the path length counter stored in path length register 406 return to the original state as if no movement has occurred since initialization" (Col. 5, lines 45-48).

Clearly, Ho is not teaching or suggesting "maintaining a history of movement of each of said mobile agents... [by] accumulating a count of the accumulated number of movements for each of said mobile agents" (see: Claims 1 and 6). Ho does not accumulate a count of all

movements for a mobile device. Rather, Ho intentionally **removes** device movement information from its registers and maintains only a relative count of device movements.

The non-removed information in the Ho movement history register 302, the so-called "loop-removed path", indicates a relative path length of device movement. The path length is compared to a stored movement threshold (in movement threshold register 306) and, when the path length equals the threshold value, the mobile station reports its location to the mobile switching center (MSC) of the cellular region. After the device sends a location update "all cell IDs in the stack in movement history registers 302 are removed except the ID of the current cell" (Col. 5, lines 8-11). Ho further teaches in Col. 7, lines 15-18 that "all cell IDs are removed...and the value of the path length register 406, the movement counter 502, and the call counter 504 are set equal to 0 (step 614)". Ho clearly teaches, therefore, that the system does not keep **any** history of movements at the device.

Applicants further note that **none** of the entities in the Ho system keep the count information that is provided

from the mobile devices to the mobile switching centers (MSCs). As expressly taught in Col. 8, lines 13-16, when the MSC receives the location update from a mobile device, "the received movement counter value MC is added to the value of the cumulative movement counter MC at the VLR". However, that value is only briefly stored, until the MSC determines a new movement threshold value. As taught in Col. 8, lines 23-29, "[i]f the period of time exceeds the predefined movement threshold update interval, then a new movement threshold Th is determined...[and the] process then resets the value of cumulative movement counter MC and the cumulative call counter CC to zero". Since both the mobile device and the MSC reset their counters to zero, no history of movements is maintained. Clearly, therefore, the Ho patent does not teach or suggest the claim language.

With specific reference to the Examiners rejections and comments found on pages 3-5, Applicants submit the following arguments. The Examiner first states that "[a]s per claim 1, Ho teaches...an agent server (figure 3)". Applicants respectfully point out that Fig. 3 depicts the mobile station (see: Col. 3, lines 25-28,

Col. 4, lines 10-14 and Col. 4, lines 56-59) and not an agent server. Next the Examiner states that Ho teaches a registration server, citing Col. 4, lines 1-42. Applicants respectfully note that the passage from Col. 4, lines 1-42 describes the cellular system including all of the components shown in Fig. 2. Applicants respectfully ask the Examiner to indicate which component of the cellular system of Fig. 2 comprises a registration server. Is it the mobile switching centers (MSCs) 208 and 210, the visitor location registers (VLRs) 212 and 214, the home location register (HLR) 216, the base station systems (BSSs) 218 and 220, the base transceiver station (BTS) 222, the base stations controller (BSC) 228, or the mobile stations 230 and 232? Fig. 2 includes mobile stations 230 and 232, which clearly cannot be both agent servers and the registration server. It is well settled that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336, quoted with approval in

KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007).

Applicants further note that the Examiner later states that "Ho does not specifically teach that there exists a plurality of agent servers". Since Applicants believe that the Examiner has cited the mobile devices illustrated in Fig. 3 against the agent servers, then this subsequent remark by the Examiner contradicts the rejection. Applicants request clarification of the rejections and remarks.

The Examiner next acknowledges that the Ho patent teaches "a counter for accumulating a count of the net number of movements". Applicants have argued above that a count of the net number of movements is not the same as or suggestive of maintaining a history of movements by accumulating a count of the accumulated number of movements for each mobile agent. The Examiner has concluded that "it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the net movement number with a gross movement number" citing Col. 2, lines 42-51. Applicants reiterate that conclusory statements have been held to be

insufficient to sustain an obviousness rejection (Ibid). Applicants further argue that Ho ***expressly teaches away*** from counting a gross movement number, stating at Col. 2, lines 37-39 that "reporting is necessary only when the mobile station is far away from its last updated location" and at Col. 2, lines 42-51 "the movement-based scheme...does not perform as well as the distance based scheme as the mobile station may be close to or at the last updated location even though it has performed a specified number of cell boundary crossings". A reference that teaches away from the claimed invention or claimed feature thereof cannot be said to obviate that claim or claim feature (In re Gurley, 27 F.3d 551, 31 USPQ2d 1130 (Fed. Cir. 1994)).

The Examiner also acknowledges that "Ho does not specifically teach the generation of requests to update information" but concludes that it would be obvious to modify Ho's "transmittal and implementation of update information". Applicants respectfully disagree with the Examiner's conclusion. The present invention teaches and claims that agent servers send requests for updates, but that the registration server might not, necessarily,

update its information about the agent server sending the request. As detailed in the Specification at page 3, lines 7-12 and page 13, line 20-page 14, line 24, the registration server compares the accumulated number of movements in an update request to a stored accumulated number of movements for the mobile agent and updates the location information only when the accumulated number of movements in the update request exceeds the stored accumulated number of movements (see also, Claims 5 and 10). Ho neither teaches nor suggests that updates from a mobile device be in the form of requests, nor that the MSC consider whether to implement updates with received information. Rather, the Ho mobile device sends the location update, the MSC temporarily updates its counters, determines whether a movement threshold update interval has elapsed, updates the movement threshold and then purges its counters of all information except the device's newest location (Col. 8, lines 8-35). Applicants assert that it would not be obvious to modify Ho to include update requests, in the absence of some teaching(s) to that effect.

Applicants respectfully assert that the Examiner has not established a *prima facie* case of obviousness against the claim language. To establish a *prima facie* case of obviousness, the cited art must teach or reasonably suggest each of the claim features. A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art (In re Bell, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993)). "All words in a claim must be considered in judging the patentability of that claim against the prior art" (In re Wilson, 424 F. 2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970)). If the cited references fail to teach each and every one of the claim limitations, a *prima facie* case of obviousness has not been established by the Examiner.

Since Ho does not teach means or steps for maintaining a history of movements which includes a counter for accumulating a count of the accumulated number of movements for each mobile agent, or steps or means for periodically generating requests for updating location information, it cannot be maintained that the Ho

patent obviates the invention as set forth in the independent claims, Claims 1 and 6. Further, Ho does not teach or suggest comparing the count to a predetermined threshold (Claims 3 and 8), since Ho changes the movement threshold. Ho does not teach or suggest generating a request for updating location information based on a comparison to a predetermined threshold or renewing location information based on updates (Claims 4, 5 and 9). Finally, Ho does not teach or suggest that a registration server compares the accumulated number of movements in an update request to a stored accumulated number of movements for the mobile agent and updates the location information only when the accumulated number of movements in the update request exceeds the stored accumulated number of movements (Claims 5 and 10) since Ho does not teach accumulated counts, does not teach update requests, does not teach storing a history of accumulated movements, and does not teach any comparison of accumulated counts. Applicants contend that the Examiner has failed to establish a *prima facie* case of obviousness against the claims.

Based on the foregoing amendments and remarks,
Applicants respectfully request entry of the amendments,
reconsideration of the amended claim language in light of
the remarks, withdrawal of the rejections, and allowance
of the claims.

Respectfully submitted,

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